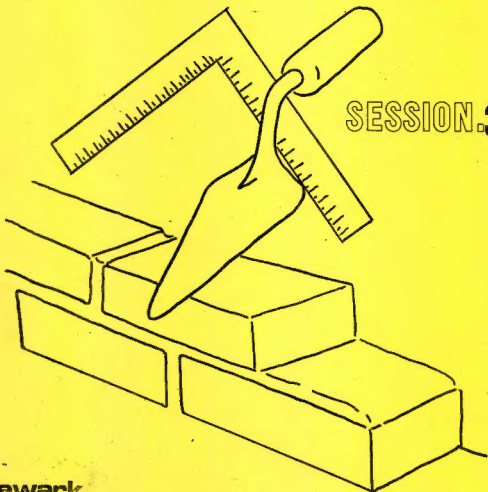


NWK
HOUSING AUTH
MISC 1977

MASONRY

N. J. DOCUMENTS
NEWARK LIBRARY

SESSION. 3



newark
redevelopment &
housing authority

HOMEOWNERS TRAINING COURSE

AT

NEWARK REDEVELOPMENT AND HOUSING AUTHORITY

MAINTENANCE TRAINING CENTER

4 Sheffield Drive

Newark, N.J. 07104

Saturday, October 5, 1977

9:00 a.m. - 1:00 p.m.

Instructor: Ralph Zanga

M A S O N R Y

Session #3 Cement - Brick - Block

- a) Removing and cleaning brick
- b) Removing and cleaning block
- c) Removing and preparing cement to be replaced

MASONRY

Concrete Patching Brick and Block Work

Session #3

Though most people think of concrete as an indestructible type of building material that never needs maintenance or repair, this is only partly true. Constant exposure to alternating cycles of freeze-and-thaw weather, coupled with the settling of supporting foundations or surface soil, can cause cracking and crumbling in all types of masonry construction. Regardless of whether repairs must be made on a concrete walk or driveway, on steps or patio floors or on basement foundation and wall, the tools and techniques involved are practically the same.

The basic material used in all types of concrete and cement work is powdered portland cement. When mixed with sand and water (1 part cement to 3 parts sand), the mixture is referred to as cement and is used for such jobs as patching cracks in masonry walls and floors and for making small patches in stucco and concrete. To make mortar, lime is added (1 part cement, 1 part lime, 3 parts sand). To make concrete, gravel is added (1 part cement, 2 parts sand and 3 parts gravel).

Though you can mix your own materials by purchasing sand, cement and gravel separately, a great deal of time and trouble can be saved by purchasing dry, premixed concrete. This comes in different-sized bags (from 10 to 80 pounds) and is sold in hardware stores and lumberyards everywhere. No measuring or proportion of ingredients is required. All you do is add water according to the directions on the bag. Mixing can be accomplished in a wheelbarrow, on a flat piece of plywood or directly on a sidewalk or basement floor.

When purchasing these ready-mixed materials, remember that there are three different "mixes" or formulas available; sand mix, mortar mix, and gravel mix. The sand mix is used for the majority of home patching jobs where cracks and holes must be filled in or where small broken sections must be replaced. Mortar mix is used for assembling brick, stone or cement block walls, while gravel mix is used for building walks, driveways and foundation walls.

When in doubt, the homewoner should consult his dealer before the purchase is made

When mixing cement or concrete always empty the bag completely so that the ingredients can be thoroughly dry-mixed before hand. The easiest way to do this is to turn the pile seven times with a shovel or hoe. If only part of the bag will be used, put back whatever is not needed before the water is added. Add water gradually, measuring out right quantities as recommended on the package. Too much will not only make a soupy mix that will be hard to handle, it will also result in a weak patch which will not stand up as it should.

To patch small cracks or broken pieces on concrete floors, walls, or walks, here is the procedure to follow:

- 1) Use a cold chisel and a hammer to undercut the sides of the opening so that it is wider at its deepest part than it is at the surface. This is necessary to insure a good mechanical bond which will keep the new concrete from falling out as it dries.
- 2) Use a stiff brush (a wire brush is best) to scrap out thoroughly all loose particles and chips and make certain the cavity is clean.
- 3) Wet down the area inside and around the crack so that the old concrete will not draw water out of the new cement before it has had a chance to set properly. The surface should be thoroughly damp, but there should be no surface water visible.
- 4) Pack in freshly mixed cement (sand mix) using a small triangular-shaped pointing trowel. Tamp firmly, then smooth off at the surface to make it even with the surrounding area.
- 5) For maximum hardness, patches should be kept damp for several days. The easiest way to do this is to allow the cement to set till partially stiff, then cover with wet burlap or straw. Sprinkle this periodically to keep it from drying out.

When you replace large broken sections in a concrete sidewalk or patio, the same basic procedure is followed. Gravel mix is used instead of sand mix to assure matching of the original surface in texture and strength. Undercut the edges of the old concrete and make certain that the sides of the broken section do not slope outward.

This would necessitate troweling the cement out to a feather edge, which would almost certainly result in having it crack out within a short while.

If the repair does not go all the way through the old surface, chop it out deeply enough to make certain that the new section will be at least 1 inch thick at all points. Roughen the bottom as well as the sides of the cavity before the new material is applied.

After the concrete is poured, it should be leveled off by dragging the edge of a long straight board across the top. Allow the patch to stiffen slightly, then rub with a wooden float (a trowel with a wooden face). For a smoother finish the concrete can be slicked down by rubbing a second time with a steel plasterer's trowel.

To repair crumbling mortar joints in a brick wall, mortar mix is the best material to use. Scrape out the cracked or crumbling mortar to a depth of at least $\frac{1}{2}$ inch, then brush clean and wet down. Pack tightly with mortar cement, then finish by scraping off excess mortar with the tip of the trowel.

To simplify the problem of applying a concrete patch where only a thin layer of cement is needed and to eliminate the need for undercutting, chipping and prewetting of the surface, there are other types of concrete patching material which can be used. Each consists of a dry powdered cement, but one type comes with a special liquid latex which you use instead of water. The other type is mixed with water, but it has a special vinyl binder added to the cement which greatly increases its adhesive power. Both of these patching cements can be spread on layers as thin as $\frac{1}{16}$ of an inch, and there is no need for preliminary wetting, chipping or undercutting. They also have a very strong bonding action, making them ideal for use in replacing loose bricks on stoops or terrace borders.

Here are the basic facts about

Concrete blocks have blossomed out. They're no longer the ugly ducklings of the building trade. You can now buy blocks with handsome surface textures and in dozens of sizes and shapes. They're designed not only for eye appeal but for practically every wall-construction need.

Besides these new advantages, concrete blocks retain two old advantages for the home handyman: 1) They're easy to use; 2) they cost less than brick or stone.

What they're made of

Concrete blocks may be either heavyweight (between 40 and 50 pounds for a standard 8"-by-8"-by-16" unit) or lightweight (25 to 35 pounds). The heavyweights are made of portland cement and water, mixed with such aggregates as sand, gravel or crushed rock. While they provide high load-bearing strength, they are less popular today than the lightweight blocks.

CONCRETE BLOCKS

Sizes and shapes

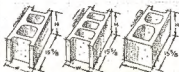
While some concrete blocks in the smaller sizes are molded solid like brick, the majority of the larger blocks are cored. The most common of these hollow blocks has a face that is nominally 8" high and 16" long (actually 7 $\frac{3}{4}$ " by 15 $\frac{3}{4}$ " to allow for $\frac{3}{8}$ " mortar joints). Its nominal width can be 8", 10" or 12".

Stretchers make up the bulk of any conventional wall. For any special

These are the most

STANDARD WALL

Two- and three-core standard wall blocks come in 8", 10" and 12" nominal widths. Examples shown (two of each) are half-hollow-ended stretchers, corner types, and double-corner types.

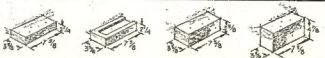
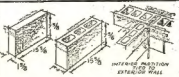


common types of blocks



PARTITION-WALL and BRICK

Solid, partition-wall blocks and cored blocks of 4" and 6" nominal width are used also for cavity walls and floor slabs. Brick (far right) may have frog (mortar recess) or flat face.

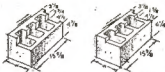


These blocks solve special

wall-building problems

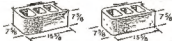
FULL and HALF HEADERS, HALF CAP and CAP

Headers tie in floor joists, bond brick facing to block walls. Half caps seal exposed part of course below a wall step-in. Cap blocks top standing walls.



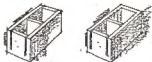
BULL-NOSE WALL

Bull-nose blocks take the place of standard corner blocks for rounded corners, columns, etc.



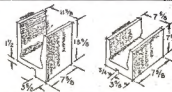
BOND BEAM

Designed to tie a wall together at the top, bond-beam blocks provide either knockouts or open channels for reinforcing rods and poured concrete.



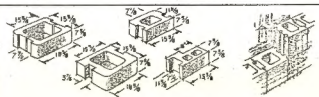
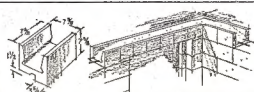
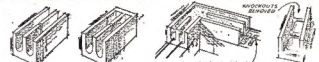
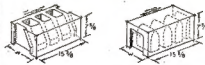
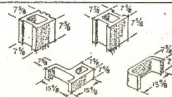
LINTEL

Used over doors and windows, lintel blocks have recesses for sash or frames. They come in single and double height for short- or long-span openings. Mating bond blocks continue channels over adjacent walls.



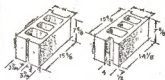
CONTROL JOINT and PILASTER

Tongue-and-groove mating of control-joint blocks lets large walls expand and contract (the joints are sealed with caulking). Pilaster blocks increase stability of load-bearing walls. Some, like those here, have recesses in the ends for control joints.



CONVENTIONAL SASH and JAMB

Recessed at one end to accommodate either metal sash, frames or jambs, these blocks come in standard and half-block sizes. Bull-nose sash and jamb blocks are also available.



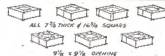
SILL

Used below windows, sill blocks have top faces designed for (left to right) standard wood frames, metal frames, broad stools.



CHIMNEY

Combinations of chimney blocks will accommodate three standard sizes of chimney tile, a cylindrical flue, or multiple flues.



problems, however, as for corners, you may need one or more variations. Most large lumberyards can supply you with a wide selection—half-blocks and blocks with one or two flat ends, blocks with one or two corners rounded, and blocks with special

recesses for door jambs, window casings, glass-brick inserts, and steel or poured-concrete reinforcing cores. Among the solid types of blocks are small bricklike units and coping sections, together with several kinds of ornamental blocks.

A look at the blocks on these pages will familiarize you with their names, sizes and uses. But before you start on any concrete-block project, check with the suppliers in your neighborhood to find out what sizes are available or can be ordered for you. Then

plan your work to conform with the block dimensions. It's a waste of time to make a fireplace some odd length, or to set a door in some arbitrary spot, and then have to chip or cut off blocks to fit. With a bit of foresight, you eliminate such problems.

Off-size and textured blocks



When planning a home improvement, you may want to consider some of the many ornamental concrete blocks that are available. A unit that is similar to the standard block, but only half as high (4"), gives a pleasing, modern wall effect when the horizontal joints are accented. Square stretchers with one corner recessed

are also available. Grouped in fours, they produce rosette, rectangle or diamond patterns. For a unit with unusual texture, you might go for one of two newcomers in the field—split block or slump block.

The split block has a rough face and is unusually long and thin, but its base dimensions are standard.



Slump block is a peculiar offering with a remarkably unblocklike appearance. It is made from a concrete mix that causes the units to sag or slump when they are taken from the molds. Both height and texture vary enough to give a rugged, informal look.

For still more variety, blocks are

offered in soft pastel shades (usually greens and browns). Unlike blocks that are painted on the outside after they are set up, these need no further maintenance. The color is cast right into them. Special blocks with hard-glazed, waterproof faces similar to tile are also on the market. Some are glazed on both faces.

RULES for building with blocks

Concrete blocks are inexpensive and easy to handle. Professional masons will tell you that they stack up three times faster than brick, and with less than half the mortar. Here are a few simple block-building rules. Follow them and you'll be sure of a strong, workmanlike wall, even if you've never tried using blocks before.

1 Always rest a block on a solid footing

It's important to provide a solid base for a block wall, not only for strength but to seal out moisture from below. Make the footing of poured concrete. For a fireplace, indoors or out, this takes the form of a large concrete pad. The footing for a regular wall should be placed below frost line. Make it as deep, and twice as wide, as the wall is thick. Center the wall on this footing for equal load distribution.

2 Use dry blocks

If you must store blocks outdoors before using them, protect them from the rain with a tarp or some building paper. Wet blocks expand. If you set them up in this condition they will shrink when drying, giving you weak, possibly leaky joints.

3 Choose the right mortar mix

For most purposes a good mortar mix is one part masonry cement and three parts sand. For an extra-

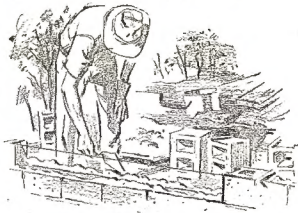
strength mortar, as for a high retaining wall, use only two or three parts sand to one part portland cement. In either case, mix with just enough water to give a plastic mix that clings nicely to the trowel and block, without being so soft that it squeezes down too much when you lay the block. Test the consistency of the mix between a pair of blocks.

4 Cover the footing with a full bed of mortar

This insures a good bond for the first course of blocks. Before you place each block after the first one, butter one end of it with mortar and squeeze it against the preceding block to give a $\frac{1}{8}$ " joint. Use your trowel to cut off any mortar that oozes out, unless you want it to harden that way for an informal appearance.

5 End one course before starting another

It's a way to avoid inaccuracies. For the second and successive courses, spread mortar on top of the laid block in the area that the new one will cover—usually only along the front



Lay corner blocks first. Stretch string between them as face guide.

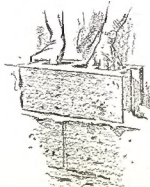
and back edges. To build a stronger wall, if needed, use full-bed joints. You get these by spreading mortar over the entire top surface of the cement block.

6 Make frequent checks with a level

Unless you are doing a job where joint irregularities are part of the decorative scheme, check each block lengthwise and from front to back with a level, as you go. Stretch a string from one end of the wall to the other to insure block alignment and use the level, vertically, for frequent plumb checks.

7 Don't use mortar that's gotten too old

Your mortar will stay usable for about two hours in hot weather, and



Apply mortar to block end before placing it.



Point formal-wall joints as soon as the mortar starts to stiffen.



To clean face, wipe with gunny sack, or scrape with wood.



True blocks with long level, or short one on straight 2"-by-4".

CHOOSING AND USING CONCRETE BLOCKS

RULES

(continued)

a bit longer under cool conditions. Within those time limits you can retemper it by working it over with a shovel or trowel, adding a little water when needed. But when the mortar begins to lose its cohesiveness, don't try to make it "stretch." Throw it away and mix another batch.

8 Point joints, clean block faces as you go

As the mortar joints stiffen up, go back and wipe any spilled mortar from the faces of the blocks with a gunny sack. Then point up the joints the way you want them to look.

9 Now seal the top of the wall

It's important to seal off, or cap, the top of a hollow-block exterior wall, to keep out rain. Some manufacturers make solid block for this. If your dealer doesn't stock them, you can do the job by sandwiching strips of expanded metal lath in the last horizontal joint. After you lay the final course of blocks, plump mortar into the voids until you have filled them flush with the top of the wall.

A good way to bind a wall tightly together, and at the same time cap it, is to make the top course a bond beam. Use channel blocks with metal lath under them. Lay these blocks channel-side up, and fill the trough they form with concrete. By embedding two lengths of reinforcing rod in the concrete you can strengthen the cap still more.

3 gravel
2 sand
1 cement

77

B. Chelis
Ch. of Maint.
Nwk. Housing Auth.

Mrs. Walker